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ORIGINAL RESEARCH

Needs Assessment for the Establishment of Master's Degree Programs in Respiratory Care in the Kingdom of Saudi Arabia

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Background: Despite recent advancements in the respiratory care (RC) profession, no single institution in the Kingdom of Saudi Arabia (KSA) offers a master's degree program in RC.

Methods: A nationwide and validated survey was used to explore the current needs and interests in establishing RC master's degree programs in the KSA. The process included representatives from the healthcare industry, universities, and professional societies.

Results: A total of 1250 stakeholders across the KSA completed the survey. The sample includes 722 (58%) males, 504 (40%) respiratory therapists, 547 (44%) students, 138 (11%) leaders, and 61 (5%) were academic respondents. Most respondents were from Central 491 (39%) and Eastern 307 (25%) regions, with 1003 (80%) of the total sample worked or studied in governmental sectors. A total of 574 (82%) of the leaders and RTs had Bachelor degree and 430 (61%) of them had 1–5 years working experience. According to 80% of the employers and employees, only 0–5% of the RTs in their organization had a master's degree. The calculated mean % of the agreement (agree/strongly agree) on the needs was 83% in all needs' assessment items, which shows a great support for establishing a master's in RC to meet the personal, professional and society needs. The mean % of the agreement for the level of interests among all participants was 86%, indicating a great level of interests in establishing a master degree in RC. The agreement % on the needs assessment and level of interests in establishing a master degree in RC in KSA were ≥80% in each stakeholder group.

Conclusion: There are obvious needs and interests in establishing master's degree programs in RC in the KSA. A master's degree in RC should be established to address the growing needs for advanced RC services throughout the nation and enhance RC research.

Keywords: respiratory care, master degree, education, Saudi Arabia, NCAAA, accreditation

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Introduction

Respiratory care (RC) profession is an essential health-care service given in modern health-care systems. Twenty years of extensive clinical research have offered respiratory therapists with new diagnostic and therapeutic techniques for evaluating and treating patients with more complicated cardiopulmonary conditions.[1] RC emerged as a profession in the United States (US) in the 1940s with on-The-job training, and since then, the role of the respiratory therapist (RT) has grown significantly to include a far broader range of duties.[2] More than 50% of RTs work in acute care facilities, where they provide therapeutic and diagnostic services to patients.[2,3] Many others are employed in a variety of settings, including sub-acute and home care, academic institutions and research groups, medical equipment sales, marketing, and clinical education.[3] In 2003, the American Association for Respiratory Care (AARC) released a seminal statement on education and credentialing, encouraging RTs to pursue higher education and credentialing.[4] While RC development has been sluggish in the US, 61 of 438 programs currently provide bachelor or master degrees in RC.[1]

In the Kingdom of Saudi Arabia (KSA), the Prince Sultan Military College of Health Sciences in the Eastern Province established the first national academic diploma in respiratory therapy in 1988, which was then upgraded to a bachelor's degree program in RC in 2007.[5] Following that, in 1999, King Faisal University, later renamed Imam Abdulrahman Bin Faisal University in 2009, founded the first national bachelor program in the KSA.[5] There has been a fair increase and change in the RC profession's education ever since.[6] This resulted in establishing more than 20 RC bachelor programs from different governmental and private institutions across the kingdom.[7] However, over the last 35 years since the start of the RC programs in the KSA, there is no single institution offers a Master Degree in RC similar to other countries (USA, Canada, United Kingdom, and India) around the globe.

Due to the vast growth of the RC profession, it is essential that all RTs continue a high degree of critical thinking, assessment, and problem-solving abilities in order for the profession to maintain its position among other professions.[1] These capabilities are critical in today's healthcare system, since they not only increase the quality of care but also help to eliminate unnecessary care and hence expenses.[1–3] Over the next 30 years in the KSA, there will be a great need for RC services, due to population aging, increases in chronic respiratory disorders (particularly asthma and COPD), population growth in general, and developments and advancements in technology and treatment modalities.[8–12] In order to advance the science and practice of respiratory care in the KSA, establishing master's degree programs in the field are required. This will help to bridge the gap between academia, clinical research and practice, train future RC faculty, as well as to create a platform for multidisciplinary cooperation and study. Therefore, this study aims to explore and evaluate the current needs and interests of various stakeholders in KSA for the establishment of a master's degree program in RC.

Methods

Study Design and Participants

A cross-sectional nationwide survey was used to explore and evaluate the current needs and interests in establishing RC master'degree programs in the KSA. A convenience sampling method was applied to recruit potential stakeholders including students, respiratory therapists, respiratory care practitioners with leadership roles (managers, heads, and supervisors), and academics. To make sure that the sample was a representative of the whole country, we had representatives from major universities and colleges that teach RC, which helped us to reach more participants across the country. These universities and colleges were Prince Sultan Military College of Health Sciences, Imam Abdulrahman Bin Faisal University, Jazan University, King Abdulaziz University, King Saud University, Umm Al Qura University, King Saud bin Abdulaziz University for Health Sciences, King Faisal University, Taibah University, AlMaarefa University, University of Bisha and Princess Nourah Bint Abdul Rahman University. We have also representatives from the Saudi Society for Respiratory Care (SSRC), along with experts in other relevant organizations, including healthcare industry, the National Center for Academic Accreditation and Evaluation (NCAAA), Saudi Commission for Health Specialties (SCFHS) and the Central Board for Accreditation of Healthcare Institutions (CBAHI). The survey was also promoted through the SSRC to registered members using its official platforms. Social media platforms and other professional network groups, such as the official Saudi group for respiratory therapists in the KSA were used to distribute the survey. We also distributed the survey to the targeted sample in the affiliated hospitals of these universities

considering other non-affiliated hospitals. We sent two follow-up reminders to all stakeholders to increase the number of respondents, and this was with help of our representatives in each region. The survey was carried out between February 21, 2022 and April 25, 2022.

The Institutional Review Board of the Prince Sultan Military College of Health Sciences provided ethical approval for this study (IRB-2022-RC-01). Consent was deemed to have been given by responding to the survey. Personal data were anonymized and intended to be erased immediately after processing, and that this study complied with the Declaration of Helsinki.

Data Collection

A 23-questions online survey was designed and hosted on Google Forms Platform to assess the needs assessment and level of interests in establishing master degree programs in Respiratory Care. Face and content validity were developed by an expert panel of respiratory therapists, after piloting the survey to 15 participants. The survey included structured questions consisting of multiple-choice questions and adaptive responses that divided into three distinct parts. The first part contains demographic questions such as gender, age, current occupation, region, and educational qualification and experience. Part two includes eight items related to the needs assessment and the participants were asked to select the level of agreement to these statements using (Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree). Part three contains four items concerning the level of interests in the master degree, and a similar agreement scale was used to reflect the participants' views. We did assess the internal reliability of the survey by conducting Cronbach's Alpha, and the value of the Cronbach's Alpha was 86% (a very good reliability).

Power Calculation

With a confidence interval of 95%, a margin of error of 3%, and assuming a response distribution of 50%, the minimum recommended sample size was 1014 to have a national representative sample.

Statistical Analysis

We used descriptive analysis (ie, absolute values and proportions) to analyze responses and present the results. To calculate the overall agreement on each item, we added % of (agree and strongly agree) responses. The overall agreement of each section was based on the mean % of each item in the needs assessment and level of interests sections. No formal analysis was applied as this study was an exploratory. The collected answers were analyzed using the Statistical Package for the Social Sciences (SPSS) version 28.

Results

A total of 1250 stakeholders across the KSA completed the survey with a completion rate of 99%. The sample includes 722 (58%) males, 504 (40%) were RTs, 547 (44%) were students, 138 (11%) were leaders, and 61 (5%) were academic respondents. Most respondents were from central 491 (39%) and eastern 307 (25%) regions, with 1003 (80%) of the total sample worked or studied in governmental sectors. 574 (82%) of the leaders and RTs had bachelor's degree and 430 (61%) had 1–5 years working experience. According to 80% of the leaders and RTs, only 0–5% of the RTs in their organization had a master's degree. A total of 1064 (85%) of all respondents had their RC education in the KSA. Table 1 shows the demographic data and characteristics of our sample.

Needs Assessment

There were eight questions intended to assess the needs for establishing a master's degree program in RC in the KSA. The level of agreement (agree/strongly agree) on the needs was more than 50% in all the items. The calculated mean % of the agreement on the needs was 83% in all need's assessment items, which shows a great support for establishing a master's degree in RC to meet the personal, professional and society needs. Table 2 demonstrates the level of agreement and disagreement among the whole sample. We did sub-analysis to assess the level of agreement in the following groups: RTs, leaders, academic respondents and students. We found a great level of support among these different groups, which >80% of each group agreed or strongly agreed that a master degree in RC is needed to meet the

Table 1 Demographic and Characteristics Data of Our Sample (n=1250)

Variable	N (%)
Gender	
Male	722 (58%)
Female	528 (42%)
Age	
18–30 Years	968 (77%)
31–40 Years	235 (19%)
41–50 Years	43 (4%)
Current occupation	
Respiratory Therapist	504 (40%)
Head/Chief/in-charge Respiratory Therapist (Leadership role)	138 (11%)
Academic (Demonstrator)	11 (1%)
Academic (Lecturer)	36 (3%)
Academic (Assistant professor)	11 (1%)
Academic (Associate professor)	3 (0.20%)
Student	547 (44%)
Respondents by region	
Eastern Region	307 (25%)
Western Region	235 (19%)
Central Region	491 (39%)
Southern Region	165 (13%)
Northern Region	52 (4%)
Current workplace/study place	
Government	1003 (80%)
Private	247 (20%)
Highest educational qualification (n=703)	
Diploma	23 (3%)
Bachelors	574 (82%)
Masters	92 (13%)
PhD	14 (2%)
Number of years licensed in Respiratory Care (n=703)	
1–5 years	430 (61%)
6–10 years	153 (22%)

(*Continued*)

Table 1 (Continued).

Variable	N (%)
11–15 years	84 (12%)
More than 15 years	35 (5%)
Estimated number of RT staff in your department/hospital (n=703)	
Up to 20	298 (42%)
21–40	188 (27%)
41–60	85 (12%)
> 60	130 (19%)
Estimated % of RTs in your organization who hold a master degree (n=703)	
0 to 5%	563 (80%)
6 to 10%	36 (5%)
I do not Know	104 (15%)
Current education degree level (Students) (n=547)	
Diploma	15 (3%)
Bachelors	523 (95.6%)
Masters	7 (1%)
PhD	2 (0.4%)
Completed years of RC studies (Students) (n=547)	
Less than 1 year	64 (12%)
1 to 2 years	147 (27%)
3–4 years	243 (44%)
5–6 years	84 (15%)
>6 years	9 (2%)
Where did or do you receive your education in Respiratory Care? (n= 1250)	
In the KSA	1064 (85%)
Abroad	117 (9%)
Both inside and outside the country	69 (6%)

society's needs. Figure 1 presents the agreement distribution for each group, considering the overall sample agreement. More details about each group can be found in the Supplementary Tables (Tables S1–S4).

Level of Interests

In this section, there were four items intended to reflect the respondents' interest in the establishment of a master degree in RC. The mean % of the agreement for the level of interest among all participants was 86%, indicating a great level of interest. Table 2 describes the level of interest of the whole sample in establishing a master's degree in RC. We further explored the data and conducted sub-analysis for the following groups: RTs, employers, academic respondents and

Table 2 Needs Assessment and Respondents' Level of Interest for Establishing a Master Degree in RC in the Kingdom of Saudi Arabia

Level of Agreement Among Respondents (n= 1250)	SD	D	N	A	SA
Needs Assessment					
1. The current levels of training in Respiratory Care need more advancement to meet the needs of the society at the present time.	12 (1%)	32 (3%)	112 (9%)	380 (30%)	714 (57%)
2. The training and education that you received were not enough to manage all levels of Respiratory Care (including clinical, educational and research practices).	65 (5%)	190 (15%)	260 (21%)	357 (29%)	378 (30%)
3. In the future, the levels of current Respiratory Care education and training need to be advanced to meet the needs of the society.	11 (1%)	19 (2%)	107 (8%)	415 (33%)	698 (56%)
4. The level of education and training of Respiratory Care Profession should be advanced to include a graduate degree (Masters of Science in Respiratory Care)	19 (2%)	36 (3%)	100 (8%)	330 (26%)	765 (61%)
5. A master's degree in Respiratory Care would advance the levels of knowledge of Respiratory Therapists	20 (2%)	21 (2%)	101 (8%)	314 (25%)	794 (63%)
6. A master's degree in Respiratory Care would increase the levels of technical, clinical and research skills of Respiratory therapists	17 (1%)	22 (2%)	98 (8%)	312 (25%)	801 (64%)
7. A master's degree in Respiratory Care would increase the levels of satisfaction of Respiratory Therapists	20 (2%)	22 (2%)	126 (10%)	331 (26%)	751 (60%)
8. There is a need in my organization for Respiratory Therapists with the knowledge, training and skills acquired by those who complete a Master degree in Respiratory Care program?	30 (2%)	50 (4%)	182 (15%)	377 (30%)	611 (49%)
Mean N (%)	24 (2%)	49 (4%)	136 (11%)	352 (28%)	689 (55%)
Level of interests in a Master degree in Respiratory Care					
I will apply for admission to the Master Degree program in Respiratory Care if it is launched within the next 1–3 years.	39 (3%)	34 (3%)	149 (12%)	254 (20%)	774 (62%)
I will help others applying for admission to the Master Degree program in Respiratory Care if it is launched within the next 1–3 years.	12 (1%)	12 (1%)	120 (10%)	338 (27%)	768 (61%)
Do you believe that the Master Degree in respiratory Care will advance your or others career opportunities?	19 (2%)	40 (3%)	105 (8%)	285 (23%)	801 (64%)
Would you recommend to others that they consider enrolling in the proposed Master Degree program?	17 (1%)	19 (2%)	123 (10%)	342 (27%)	749 (60%)
Mean N (%)	22 (2%)	26 (2%)	124 (10%)	305 (24%)	773 (62%)

Abbreviations: SD, Strongly disagree; D, disagree; N, Neutral; A, Agree; SA, Strongly agree.

students. It gives the impression that if the planned program is offered within the next 1–3 years, there would be a substantial demand for it, as shown by our finding that >80% of the participants in each group were interested in it (Figure 1). All groups level of interests in a master's degree in RC were depicted in Figure 1, with respect to the overall sample agreement. More information about the different stakeholders can be found in the Supplementary Tables.

Discussion

The present investigation is the first to assess the current needs and interests in starting master RC programs in the KSA. The present data show that there were an overall consensus on the need to establish a master program. Moreover, participants had a great interest in pursuing higher education in RC if offered nationally. These findings strongly support

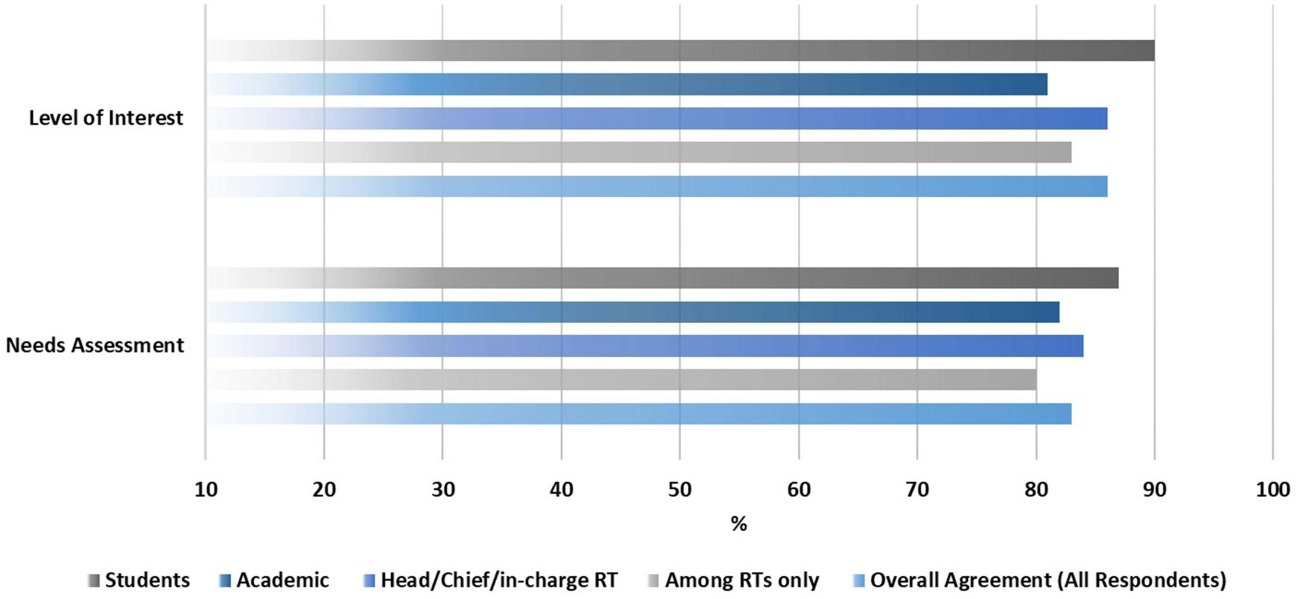

Figure 1 Needs assessment and stakeholders' level of interests for establishing a master degree in RC in the Kingdom of Saudi Arabia. Each bar represents the overall agreement (%) for each stakeholder group.

the implementation of master degree programs in RC to advance the RC science and meet the substantial demand for respiratory services in the country over the upcoming years.

It is increasingly recognized that RTs play a vital role in delivering health care services across different clinical settings.[13] Indeed, there has been a revolutionary change in the role of RTs over the past decades.[3] For instance, the earlier RTs were only required to demonstrate simple competencies in the cognitive (knowledge) and psychomotor (skills) domains of the respiratory practice.[2] However, the RTs of today perform much more complex tasks such as delivering therapeutic interventions, administering medications, assessing patients' cardio-respiratory status, applying appropriate respiratory care protocols, and contributing to the decision making regarding the goals and direction of the therapy.[3] Moreover, the RTs of today manage and work with medical devices that were not even available 20 years ago. Therefore, RTs must possess a high level of knowledge, critical thinking, and problem-solving skills to keep up with the perpetual advancements in the RTs' role.

The respondents in the present study (RT staff) showed great interest in applying for a master's degree program, if offered within the next few years. This highlights the desire to earn a postgraduate degree in RC. There is no doubt that a postgraduate degree opens many career pathways for current RTs. Earlier report showed that master degree holders are preferred for managerial positions, education, clinical specialties, and marketing (sales specialist in medical equipment or pharmaceutical industry).[14] Furthermore, as the job market for RTs continues to grow over the next 30 years,[8–10] more opportunities become available, encouraging current RT practitioners to pursue higher educational level to climb up the career ladder. The desire for RTs to complete a postgraduate degree may be due to incentive benefits (increased salary) as the practitioner is promoted to a higher position and holds more responsibilities. Personal satisfaction with earning a postgraduate degree may also be a motive to acquire knowledge and theories on a broader spectrum.

Our findings that the majority of participants supported the need for establishing master's programs may potentially overcome the severe shortage of advanced respiratory therapy practitioners. There may be a demand for master RC graduates, especially with the emerging roles of RTs, for example, focus on health care systems, which put much emphasis on the overall function of the organization.[3] Therefore, it is essential to equip future RTs with valuable cognitive knowledge and psychomotor skills to promote health, embrace change, and improve care in various settings. A master graduate should possess organizational leadership skills, which require systematic thinking, change encouragement, understanding and management of information and health care technologies, and

the ability to translate research into practice.[14] In a recent national survey, the directors of RC programs highlighted a lack of postgraduate programs and a dearth of research activity as two of the most serious challenges to improve the RC education in the KSA.[7] The lack of a master's program in RC will delay the institutions' accreditation process and will prevent the implementation of subspecialties that aim to improve the profession's research and care quality. Further, the absence of such programs would have a detrimental influence on graduates' competencies, as well as variations in their skills and patient care. During the COVID-19 pandemic, there were high demands for respiratory therapists who could quickly adapt to and manage acute patients in the absence of protocols and guidelines.[15] Alqahtani et al, evaluated the clinical practice and barriers of ventilatory support management during COVID-19 in the KSA, highlighted a lack of skilled respiratory therapists and inadequate training as the most main challenges to improved management.[15] RTs who are educated at a master's level will eventually enhance the progression of interprofessional teams to meet the demand of the health care systems.

Over the past decades, there has been an increase in the number of bachelor RC programs across the country, offering many job opportunities in academia.[7] Despite this, the current number of RTs who have post-graduate degrees (master's or doctorate) working in academia remains inadequate. The fact that respondents in the present study from academic institutions (faculty) support the need for establishing master programs highlights the current RT faculty shortage. Establishing master RC programs will certainly offer their graduates teaching and research skills; all of which are essential attributes for an academician, and therefore help in overcoming faculty shortages in academic institutions across the country.[7]

The fact that the stakeholders have a great interest in earning a postgraduate degree in RC encourages academic institutes to start setting up master's programs as soon as possible. This is not solely because of the substantial demands for advanced RC practitioners, leaders, educators, and researchers, but also because of the granted customers to those programs. The majority of participants in this study (82%) have baccalaureate degrees and therefore are potential candidates for the master program. Current baccalaureate students are also potential customers, especially those interested in obtaining educational roles or research related-jobs.

This paper has many important implications. The role of RTs has gone through a revolutionary change over the past decades, which requires current RT programs to make necessary modifications to meet the continuous change in the practice. Over the following decades, the job market for RTs will continue to grow (due to population growth and an increase in chronic illnesses, such as COPD), thus, demanding more RT staff in general and advanced RT practitioners, in particular, to keep up with the advancements in technology and treatment modalities.[11] With more new RT programs across the country, there will be a demand for RTs equipped with the skills for academia: theory, practice and research. Therefore, governmental and private academic institutes should be encouraged to start implementing master RC programs.

A strength of this study is that it has a powered sample size with relevant stakeholders, thus, providing a representative RTs sample in the KSA. We had representative experts from a wide range of relevant associations that include major universities that offer RC, healthcare industry, SSRC, NCAAA, SCFHS and CBAHI, which further validate our findings. In addition, validity and reliability were assessed and tested before distributing the questionnaire, ensuring that the measurement tool was reliable for collecting the data. However, the present study has some limitations. A self-administered questionnaire was used to collect the data which may result in inaccurate answers. Nevertheless, a maximum efforts were made to ensure the accuracy of the collected data.

Conclusion

RC master's degree programs are in high demands in the KSA, with interests from a wide range of stakeholders. For the advancement of RC profession and to meet the rising need for up-to-the-minute respiratory care services, master's degree programs in RC should be established in the KSA.

Disclosure

The authors report no conflicts of interest in this work.

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